UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION

LONE STAR TECHNOLOGICAL INNOVATIONS, LLC Plaintiff, v. ASUSTEK COMPUTER INC. Defendant.	§ § § § § § § § § § §	Case No. 6:21-cv-00336 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Lone Star Technological Innovations, LLC ("Lone Star" or "Plaintiff"), by and through its attorneys, for its Complaint for patent infringement against ASUSTeK Computer, Inc. ("ASUS" or "Defendant"), and demanding trial by jury, hereby alleges, on information and belief with regard to the actions of Defendant and on knowledge with regard to its own actions, as follows:

I. NATURE OF THE ACTION

1. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 271, *et seq*., to enjoin and obtain damages resulting from Defendant's unauthorized use, sale, and offer to sell in the United States, of products, methods, processes, services and/or systems that infringe Plaintiff's United States patents, as described herein.

2. Defendant manufactures, provides, uses, sells, offers for sale, imports, and/or distributes infringing products and services, and encourages others to use its products and services in an infringing manner, as set forth herein.

3. Plaintiff seeks past and future damages and prejudgment and post-judgment interest for Defendant's infringement of the Asserted Patents, as defined below.

II. PARTIES

4. Plaintiff Lone Star is a limited liability company organized and existing under the law of the State of Texas, with its principal place of business located at 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

5. Lone Star is the owner of the entire right, title, and interest of the Asserted Patents, as defined below.

6. ASUS is a is a Taiwanese company with its principal place of business at No. 15, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.

III. JURISDICTION AND VENUE

7. This is an action for patent infringement which arises under the patent laws of the United States, in particular, 35 U.S.C. §§ 271, 281, 283, 284, 285, and 295.

8. This Court has exclusive jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over ASUS in this action because ASUS has committed acts within the Western District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over ASUS would not offend traditional notions of fair play and substantial justice. Defendant ASUS, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and

continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the Asserted Patents, including the accused devices as alleged herein.

10. Venue in the Western District of Texas is proper pursuant to 28 U.S.C. §§ 139l (b), (c) and l400(b) because upon information and belief Defendant ASUSTeK Computer Inc. is a foreign entity; Defendant has committed acts within this judicial district giving rise to this action, and Defendant continues to conduct business in this judicial district, including one or more acts of selling, using, importing and/or offering for sale infringing products or providing service and support to Defendant's customers in this District.

IV. COUNTS OF PATENT INFRINGEMENT

11. Plaintiff alleges that Defendant has infringed and continue to infringe the following United States patents (collectively the "Asserted Patents"):

United States Patent No. 7,391,416 (the "'416 Patent") (Exhibit A)
United States Patent No. 7,512,269 (the "'269 Patent") (Exhibit B)

COUNT ONE
INFRINGEMENT OF U.S. PATENT 7,391,416

12. Plaintiff incorporates by reference the allegations in all preceding paragraphs as if fully set forth herein.

13. The '416 Patent, entitled "Fine tuning a sampling clock of analog signals having digital information for optimal digital display," was filed on December 26, 2002 and issued on June 24, 2008.

14. Plaintiff is the assignee and owner of all rights, title and interest to the '416 Patent, including the right to recover for past infringements, and has the legal right to enforce the patent, sue for infringement, and seek equitable relief and damages.

Technical Description

15. The '416 Patent addresses problems in the prior art of analog to digital signal conversion.

16. The specification illustrates this by stating that "[a] main aspect of novelty and inventiveness of the method and system of the present invention is whereby a relatively Small amount of information from input signals is required for rapidly and accurately determining values of the frequency and phase of a sampling clock." 6:52-56.

17. "More specifically, after measuring and obtaining pixel values while sweeping the phase values of signals using a phase locked loop (PLL) mechanism (functioning with hardware and/or software components), the method and system of the present invention determine values of two parameters, (i) error of an initial frequency value of the sampling clock, herein, also referred to as RX clock, being proportional to error value of an initial phase locked loop (PLL) division factor value, and (ii) phase of the sampling clock (RX clock), without need for making additional measurements based on values of these two parameters." 6:56-67.

Direct Infringement

18. Defendant, without authorization or license from Plaintiff, has been and is directly infringing the '416 Patent, either literally or equivalently, as infringement is

defined by 35 U.S.C. § 271, including through making, using (including for testing purposes), importing, selling and offering for sale digital display devices that infringe one or more claims of the '416 Patent. Defendant develops, designs, manufactures, and distributes digital display devices that infringes one or more claims of the '416 Patent. Defendant further provides services that practice methods that infringe one or more claims of the '416 Patent. Defendant is thus liable for direct infringement pursuant to 35 U.S.C. § 271. Exemplary infringing instrumentalities include the Asus MM17T LCD Monitor, and all other substantially similar products (collectively the "'416 Accused Products").

19. Lone Star names this exemplary infringing instrumentality to serve as notice of Defendant's infringing acts, but Lone Star reserves the right to name additional infringing products, known to or learned by Lone Star or revealed during discovery, and include them in the definition of '416 Accused Products.

20. Defendant is liable for direct infringement pursuant to 35 U.S.C. § 271 for the manufacture, sale, offer for sale, importation, or distribution of Defendant's MM17T LCD Monitor.

21. Defendant's MM17T LCD Monitor is a non-limiting example of an apparatus that meets all limitations of claim 1 of the '416 Patent, either literally or equivalently.

22. The MM17T LCD Monitor implements a method of receiving digital synchronization signals of analog signals having digital information for digital display and detecting format based on said received digital synchronization signals.

23. For example, Defendant provides MM17T LCD monitor which receives HSYNC and VSYNC signal ("digital synchronization signals") along with RGB signals ("analog signals") having digital information for digital display and detects format based on said received digital synchronization signals.

24. The MM17T LCD Monitor sets an initial frequency value of a sampling clock of said analog signals by setting a phase locked loop division factor value equal to a digital horizontal synchronization signal cycle based on said detected format, and setting a phase value of the sampling clock at a phase locked loop mechanism.

25. For example, Defendant's MM17T LCD monitor comprises MStar SoC LCD driver with chip number-TSU16AWK. This chipset integrates an Analog to Digital Converter (ADC) and a Phase Locked Loop (PLL). ADC is used to convert analog signals from VGA cable into digital signals by generating a sampling clock using the PLL. To provide the right sampling clock, tuning is done using said PLL which makes use of digital synchronization signals. The frequency and phase of the sampling clock are tuned using the PLL, the initial frequency value of the sampling clock is set by making the phase locked loop division factor equal to the HSYNC signal ("digital horizontal synchronization signal cycle").

26. The MM17T LCD Monitor fine tunes the "initial frequency value of the sampling clock by fine tuning said phase locked loop division factor value, and fine tuning said phase value of the sampling clock, for synchronizing "phase locked loop mechanism with a sampling period."

27. For example, Defendant's MM17T monitor, auto-tunes the frequency and phase of the sampling clock using the Phase Locked Loop mechanism to sample the analog signals from VGA cable connected to MM19S monitor to synchronize the PLL with sampling period.

- Auto-tuning function including support for phase selection, image position, offset & gain and jitter detection
- Smart screen-fitting

■ On-screen display controller (OSD)

- Built-in OSD generator with 291 character font programmable RAM

Source: https://datasheetspdf.com/pdf-file/790549/Mstar/TSU16AK/1 , Page 1

The TSU16AK incorporates the world's first coherent oversampled RGB graphics ADC in a monitor controller system[1]. The oversampling ADC samples the input RGB signals at a frequency that is much higher than the signal source pixel rate. This can preserve details in the video signal that ordinarily would be lost due to input signal jitter or bandwidth limitations in non-oversampled systems.

Source: https://datasheetspdf.com/pdf-file/790549/Mstar/TSU16AK/1 , Page 2

02h	PLLDIVM	7:0	Default : 0x69	Access : R/W
	PLLDIV[11:4]	7:0	PLL Divider ratio. When bank 1 register 3Dh[4] = 0 ADC PLL will multiply the horizontal line frequency by PLLDIV[11:0] + 3 to generate the ADC sampling clock. When bank 1 register 3Dh[4] = 1 ADC PLL will multiply the horizontal line frequency by (PLLDIV[11:0] +3)*2 to generate the ADC sampling clock.	

Source: https://datasheetspdf.com/pdf-file/790549/Mstar/TSU16AK/1 , Page 11

11h	CLKCTRL2	7:0	Default : 0x00	Access : R/W
	-	7	Reserved.	
	PHASECC[6:0]	6:0	Clock phase adjust for ADC sampling time point. Phase is adjustable between 0 and 360° in 5.6° steps.	
12h	VCOCTRL	7:0	Default : 0x15	Access : R/W

Source: https://datasheetspdf.com/pdf-file/790549/Mstar/TSU16AK/1 , Page 13

28. The MM17T LCD Monitor determines "an error value of said phase locked loop division factor value, said error value being a difference between an actual said phase locked loop division factor value and a said phase locked loop division factor value matching said initial frequency value of the sampling clock to a frequency value of a transmitter timing clock";

29. Defendant performs and induces others to perform fine tuning of said initial frequency value by determining an error value of said phase locked loop division factor value, said error value being a difference between an actual said phase locked loop division factor value and a said phase locked loop division factor value matching said initial frequency value of the sampling clock to a frequency value of a transmitter timing clock.

30. For example, upon information and belief, defendant's MM17T monitor, auto-tunes the frequency and phase of the sampling clock using the Phase Locked Loop mechanism. This tuning is done by determining an error value of said phase locked loop division factor, said error being a comparison of PLLDIV*HSYNC_FREQ (i.e. ADC sampling clock) with PLL sampling clock output for a certain period, where the Phase Locked Loop Division factor value (i.e. PLLDIV) is an integral characteristics of sampling clock.

31. The MM17T LCD Monitor samples the received analog signals having digital information within the sampling period.

32. For example, Defendant's MM19D monitor uses an ADC to sample the signals ("analog signals") from VGA cable to convert them into digital signal ("digital information") within said sampling period so that the digital monitor is able to display an image.

33. The MM17T LCD Monitor receives and displays the digital image pixel information by a digital display device.

34. For example, Defendant's MM19D monitor receives information from VGA port in form of analog signals and converts it into digital form ("digital image pixel information") and then uses this information to display said image.

Willful Infringement

35. Defendant has had actual knowledge of the '416 Patent and its infringement thereof at least as of learning of Lone Star's patent portfolio in the related litigation styled – *Lone Star Technological Innovations, LLC v. ASUSTek Computer, Inc.*, Case No. 6:19-CV-00059-RWS.

36. Defendant has had actual knowledge of the '416 Patent and its infringement thereof at least as of service of Plaintiff's Complaint.

37. Defendant's infringement of the Asserted Patents was either known or was so obvious that it should have been known to Defendant.

38. Notwithstanding this knowledge, Defendant has knowingly or with reckless disregard infringed the '416 Patent. Defendant continued to commit acts of infringement despite being on notice of an objectively high likelihood that its actions constituted infringement of Plaintiff's valid patent rights, either literally or equivalently.

39. Defendant is therefore liable for willful infringement. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. §§ 284 and 285.

Indirect Infringement

40. Defendant has induced and is knowingly inducing its distributors, testers, trainers, customers and/or end users to directly infringe the '416 Patent, with the

specific intent to induce acts constituting infringement, and knowing that the induced acts constitute patent infringement, either literally or equivalently.

41. Defendant has knowingly contributed to direct infringement by its customers and end users by having imported, sold, and/or offered for sale, and knowingly importing, selling, and/or offering to sell within the United States the accused products which are not suitable for substantial non-infringing use and which are especially made or especially adapted for use by its customers in an infringement of the asserted patent.

42. Defendant's indirect infringement includes, for example, providing data sheets, technical guides, software and hardware specifications, installation guides, and other forms of support at https://www.asus.com/US/supportonly/MM17T/HelpDesk_Manual/ that induce its customers and/or end users to directly infringe '416 Patent.

43. Defendant's indirect infringement additionally includes marketing its products for import by its customers into the United States. Defendant's indirect infringement further includes providing application notes instructing its customers on infringing uses of the '416 Accused Products. The '416 Accused Products are designed in such a way that when they are used for their intended purpose, the user infringes the '416 Patent, either literally or equivalently. Defendant knows and intends that customers who purchase the '416 Accused Products will use those products for their intended purpose. For example, Defendant's United States website, https://www.asus.com, instructs customers to use the '416 Accused Products

in numerous infringing applications. Defendant's customers directly infringe the '416 patent when they follow Defendant's provided instructions on website, videos, and elsewhere. Defendant's customers who follow Defendant's provided instructions directly infringe claims of the '416 Patent.

44. In addition, Defendant specifically intends that its customers, such as United States distributors, retailers and consumer product companies, will import, use, and sell infringing products in the United States to serve and develop the United States market for Defendant's infringing products. Defendant knows following its instructions directly infringes claims of the '416 Patent, including for example Claim 1.

45. As a result of Defendant's infringement, Plaintiff has suffered monetary damages, and is entitled to an award of damages adequate to compensate it for such infringement which, by law, can be no less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT TWO
INFRINGEMENT OF U.S. PATENT 7,512,269

46. Plaintiff incorporates by reference the allegations in preceding paragraphs 1-13 as if fully set forth herein.

47. The '269 Patent, entitled "Method of adaptive image contrast enhancement" was filed on August 4, 2005 and issued on March 31, 2009.

48. Plaintiff is the assignee and owner of all rights, title and interest to the '269 Patent, including the right to recover for past infringements, and has the legal right to enforce the patent, sue for infringement, and seek equitable relief and damages.

Technical Description

49. The '269 Patent addresses problems in the prior art of contrast enhancement methods. The '269 describes that "contrast enhancement methods correct the pixel values of a video frame only after the complete histogram of the frame has been computed. Therefore, real-time contrast enhancement requires one or another form of delay. Usually, either the correction computed for each frame is applied to a subsequent frame or each frame is delayed long enough to have its own correction applied." 1:28-35.

50. The '269 provides a technological improvement by "enhancing the contrast of a digital image whose pixels have respective initial chroma and luma values, one luma value and two chroma values per pixel. First, a histogram of the initial luma values of at least a portion of the pixels is formed. Initial "bin indices" are computed that partition the histogram into a plurality of bins, bounded by the initial bin indices, that have substantially equal population. The initial bin indices are mapped into a corresponding plurality of final bin indices that are spaced more uniformly than the initial bin indices. The initial luma values then are adjusted in accordance with the final bin indices to provide final luma values." 3:18-29.

Direct Infringement

51. Defendant, without authorization or license from Plaintiff, has been and is directly infringing the ' 580 Patent, either literally or equivalently, as infringement is defined by 35 U.S.C. § 271, including through making, using (including for testing purposes), importing, selling and offering for sale digital display devices, including

computers, that infringes one or more claims of the '580 Patent. Defendant develops, designs, manufactures, and distributes such devices that infringe one or more claims of the '269 Patent. Defendant further provides services that practice methods that infringe one or more claims of the '269 Patent. Defendant is thus liable for direct infringement pursuant to 35 U.S.C. § 271. Exemplary infringing instrumentalities include the ASUS ZenBook UX430, and all other substantially similar products (collectively the "'269 Accused Products").

52. Lone Star names this exemplary infringing instrumentality to serve as notice of Defendant's infringing acts, but Lone Star reserves the right to name additional infringing products, known to or learned by Lone Star or revealed during discovery, and include them in the definition of '269 Accused Products.

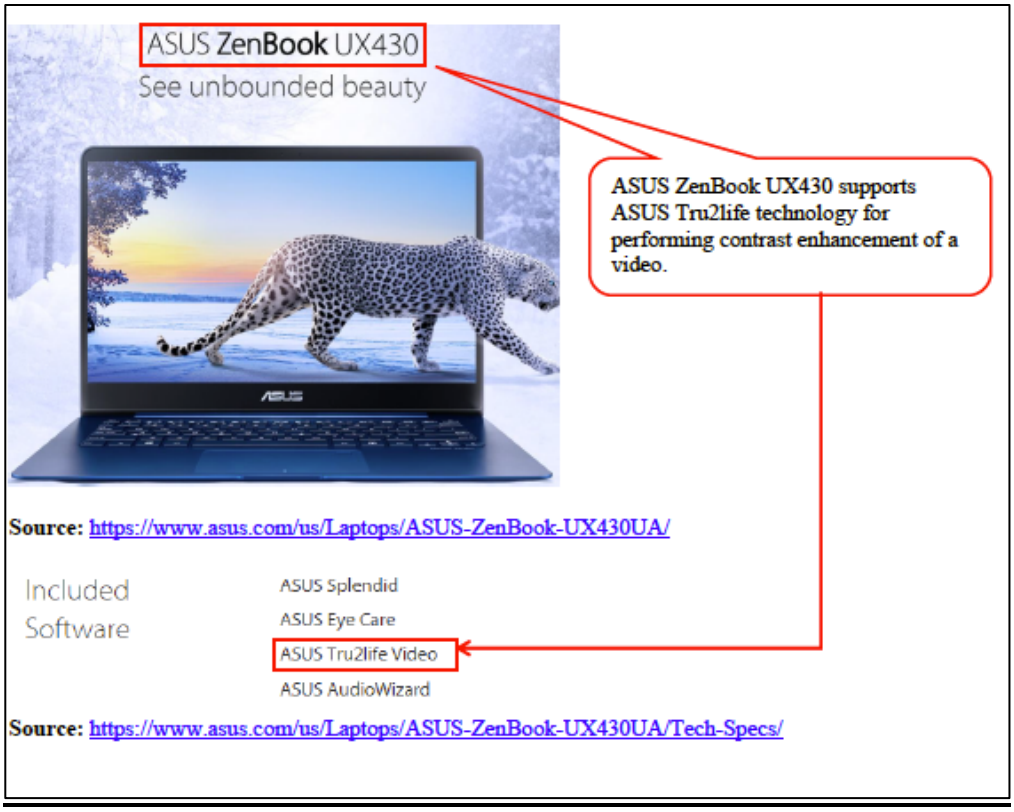
53. Defendant is liable for direct infringement pursuant to 35 U.S.C. § 271 for the manufacture, sale, offer for sale, importation, or distribution of Defendant's ASUS ZenBook UX430.

54. Defendant's ASUS ZenBook UX430 is a non-limiting example of an apparatus that meets all limitations of claim 23 of the '269 Patent, either literally or equivalently.

55. The ASUS ZenBook UX430 is a system comprising a memory for storing an image that includes a plurality of pixels, each pixel having a respective value.

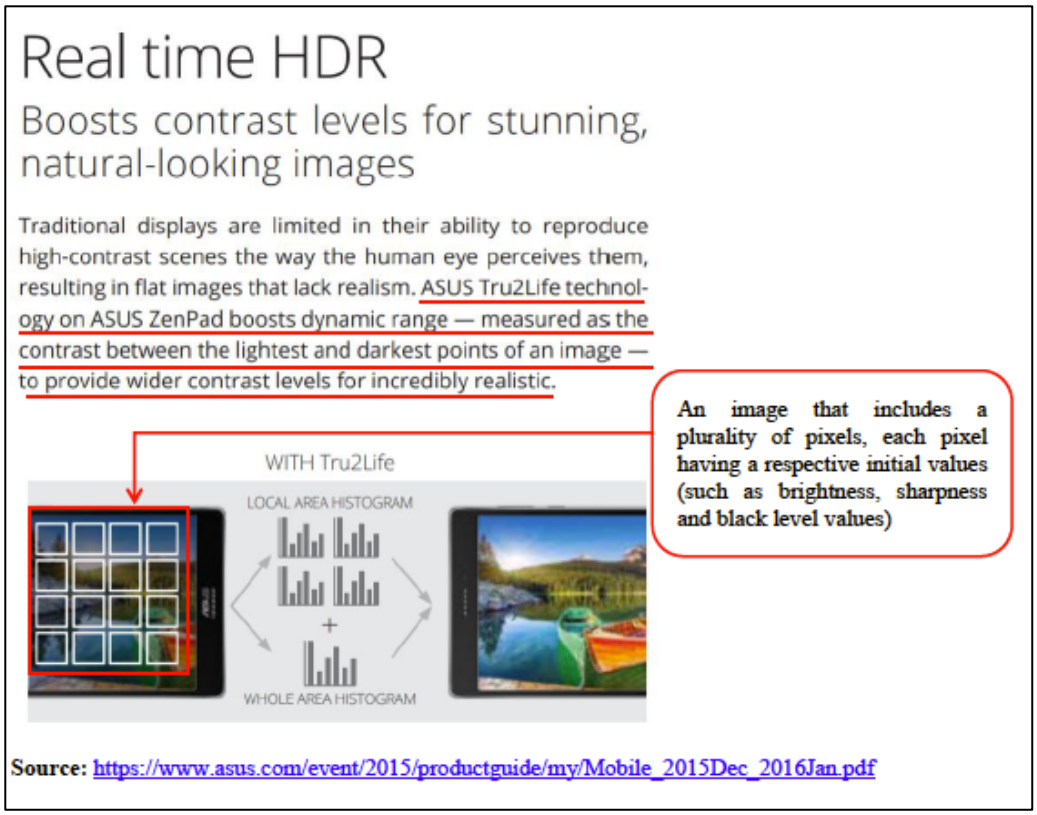
56. For example, Defendant provides laptops such as ASUS ZenBook UX430 supporting ASUS Tru2Life Video Technology to perform contrast enhancement of a video.

57. For example, for every video frame ("image") in a video displayed on the laptop screen, Defendant provides Tru2Life Video Technology which analyses brightness, sharpness and black level values ("initial values") of every pixel ("plurality of pixels") in the frame and optimizes ("adjusting the initial value") its brightness and sharpness.



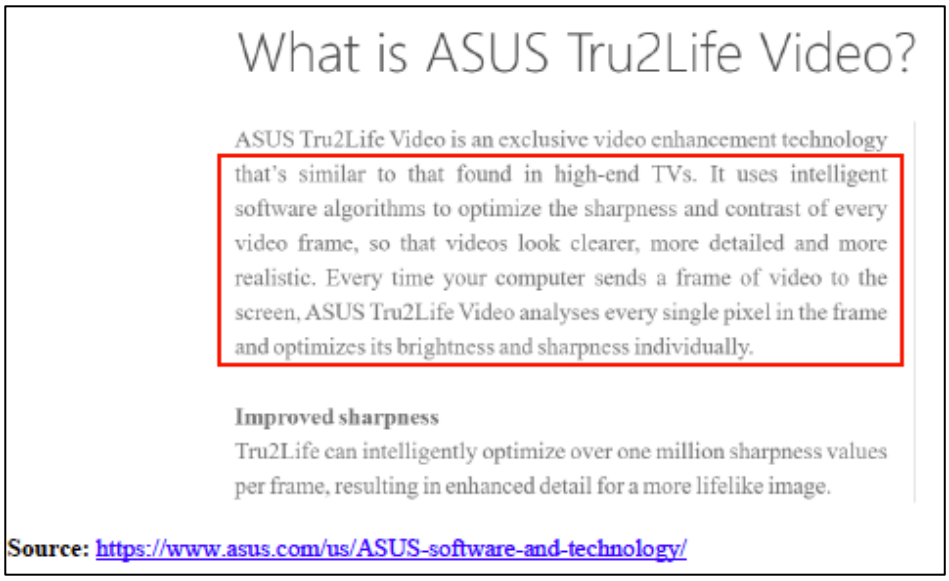
58. The ASUS ZenBook UX430 provides a processor for forming a histogram of said values of at least a portion of the pixels.

59. For example, Defendant provides Tru2Life Video Technology which optimizes over one million sharpness values per frame resulting in enhanced detail. It further analyzes the brightness histogram for each pixel in the frame") and adjusts the brightness and black level values to improve the contrast.



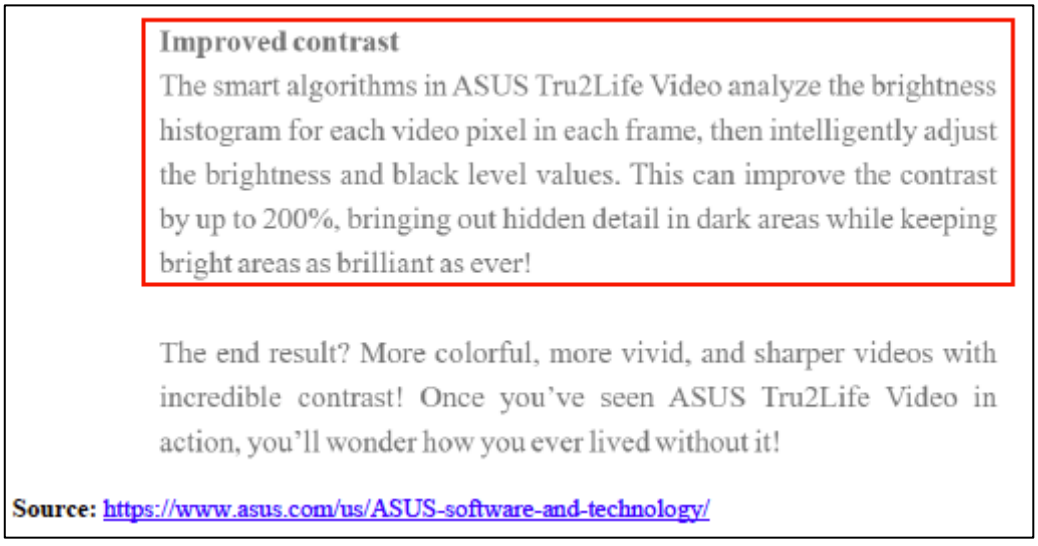
60. The ASUS ZenBook UX430 includes a processor that computes a plurality of initial bin indices that partitions said histogram into a plurality of bins that have substantially equal populations

61. For example, upon information and belief, Defendant's ASUS Tru2Life Video Technology analyses the brightness histogram of a video frame by computing plurality of initial bin indices that partitions the brightness histogram into a plurality of bins that have substantially equal population of pixel.



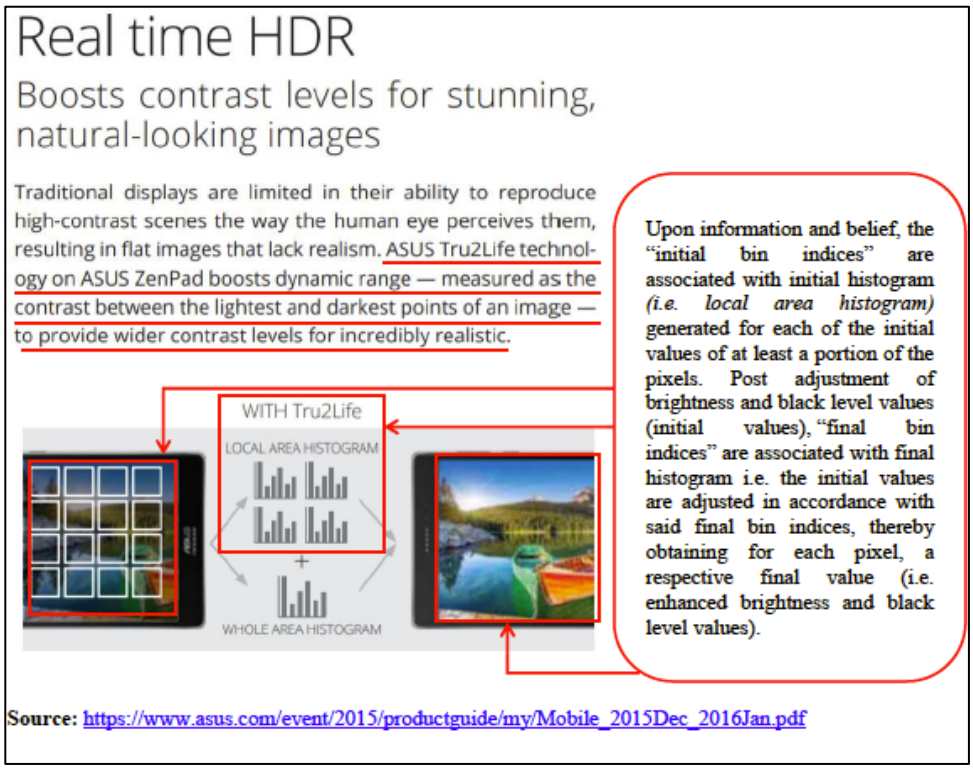
62. The ASUS ZenBook UX430 includes a processor that maps said initial bin indices into a plurality of final bin indices that are spaced more uniformly than said initial bin indices.

63. For example, upon information and belief, Defendant's ASUS Tru2Life Video Technology uses a software algorithm that maps the initial bin indices into a plurality of final bin indices that are spaced more uniformly than said initial bin indices.



64. The ASUS ZenBook UX430 includes a processor that adjusts the values in accordance with said final bin indices.

65. For example, upon information and belief, Defendant's ASUS Tru2Life Video Technology analyses histogram for each video pixel in each frame of a video and then adjusts the brightness and black level values ("initial values") in accordance with said final bin indices, thereby obtaining, for each pixel, a respective final value.



Willful Infringement

66. Defendant has had actual knowledge of the '269 Patent and its infringement thereof at least as of learning of Lone Star's patent portfolio in the related litigation styled – *Lone Star Technological Innovations, LLC v. ASUSTek Computer, Inc.*, Case No. 6:19-CV-00059-RWS.

67. Defendant has had actual knowledge of the '269 Patent and its infringement thereof at least as of service of Plaintiff's Complaint.

68. Defendant's infringement of the Asserted Patents was either known or was so obvious that it should have been known to Defendant.

69. Notwithstanding this knowledge, Defendant has knowingly or with reckless disregard infringed the '269 Patent. Defendant continued to commit acts of infringement despite being on notice of an objectively high likelihood that its actions constituted infringement of Plaintiff's valid patent rights, either literally or equivalently.

70. Defendant is therefore liable for willful infringement. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. §§ 284 and 285.

Indirect Infringement

71. Defendant has induced and is knowingly inducing its distributors, testers, trainers, customers and/or end users to directly infringe the '269 Patent, with the specific intent to induce acts constituting infringement, and knowing that the induced acts constitute patent infringement, either literally or equivalently.

72. Defendant has knowingly contributed to direct infringement by its customers and end users by having imported, sold, and/or offered for sale, and knowingly importing, selling, and/or offering to sell within the United States the accused products which are not suitable for substantial non-infringing use and which are especially made or especially adapted for use by its customers in an infringement of the asserted patent.

73. Defendant's indirect infringement includes, for example, providing data sheets, technical guides, demonstrations, software and hardware specifications, installation guides, and other forms of support at https://www.asus.com/us/Laptops/ASUS-ZenBook-UX430UA/Tech-Specs/ and https://www.asus.com/us/ASUS-software-and-technology/ that induce its customers and/or end users to directly infringe '269 Patent.

74. Defendant's indirect infringement additionally includes marketing its products for import by its customers into the United States. Defendant's indirect infringement further includes providing application notes instructing its customers on infringing uses of the '269 Accused Products. The '269 Accused Products are designed in such a way that when they are used for their intended purpose, the user infringes the '269 Patent, either literally or equivalently. Defendant knows and intends that customers who purchase the '269 Accused Products will use those products for their intended purpose. For example, Defendant's United States website, https://www.asus.com, instructs customers to use the '269 Accused Products in numerous infringing applications. Defendant's customers directly infringe the '269 patent when they follow Defendant's provided instructions on website, videos, and elsewhere. Defendant's customers who follow Defendant's provided instructions directly infringe claims of the '269 Patent.

75. In addition, Defendant specifically intends that its customers, such as United States distributors, retailers and consumer product companies, will import, use, and sell infringing products in the United States to serve and develop the United States

market for Defendant's infringing products. Defendant knows following its instructions directly infringes claims of the '269 Patent, including for example Claim 12.

76. As a result of Defendant's infringement, Plaintiff has suffered monetary damages, and is entitled to an award of damages adequate to compensate it for such infringement which, by law, can be no less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

V. NOTICE

77. Lone Star has complied with the notice requirement of 35 U.S.C. § 287 and does not currently distribute, sell, offer for sale, or make products embodying the Asserted Patents. This notice requirement has been complied with by all relevant persons at all relevant times.

VI. JURY DEMAND

78. Plaintiff demands a trial by jury of all matters to which it is entitled to trial by jury, pursuant to FED. R. CIV. P. 38.

VII. PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays for judgment and seeks relief against Defendant as follows:

A. That the Court determine that one or more claims of the Asserted Patents is infringed by Defendant, both literally and under the doctrine of equivalents;

B. That the Court determine that one or more claims of the Asserted Patents is indirectly infringed by Defendant;

C. That the Court award damages adequate to compensate Plaintiff for the patent infringement that has occurred, together with prejudgment and post-judgment interest and costs, and an ongoing royalty for continued infringement;

D. That the Court permanently enjoin Defendant pursuant to 35 U.S.C. § 283;

E. That the Court find this case to be exception pursuant to 35 U.S.C. § 285;

F. That the Court determine that Defendant's infringements were willful;

G. That the Court award enhanced damages against Defendant pursuant to 35 U.S.C. § 284;

H. That the Court award reasonable attorneys' fees; and

I. That the Court award such other relief to Plaintiff as the Court deems just and proper.

Dated: April 6, 2021

Respectfully submitted,

/s/Bradley D. Liddle

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